

Hey2 Cas9-CKO Strategy

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Reviewer:

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Design Date:

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Project Overview

Project Name

Hey2

Project type

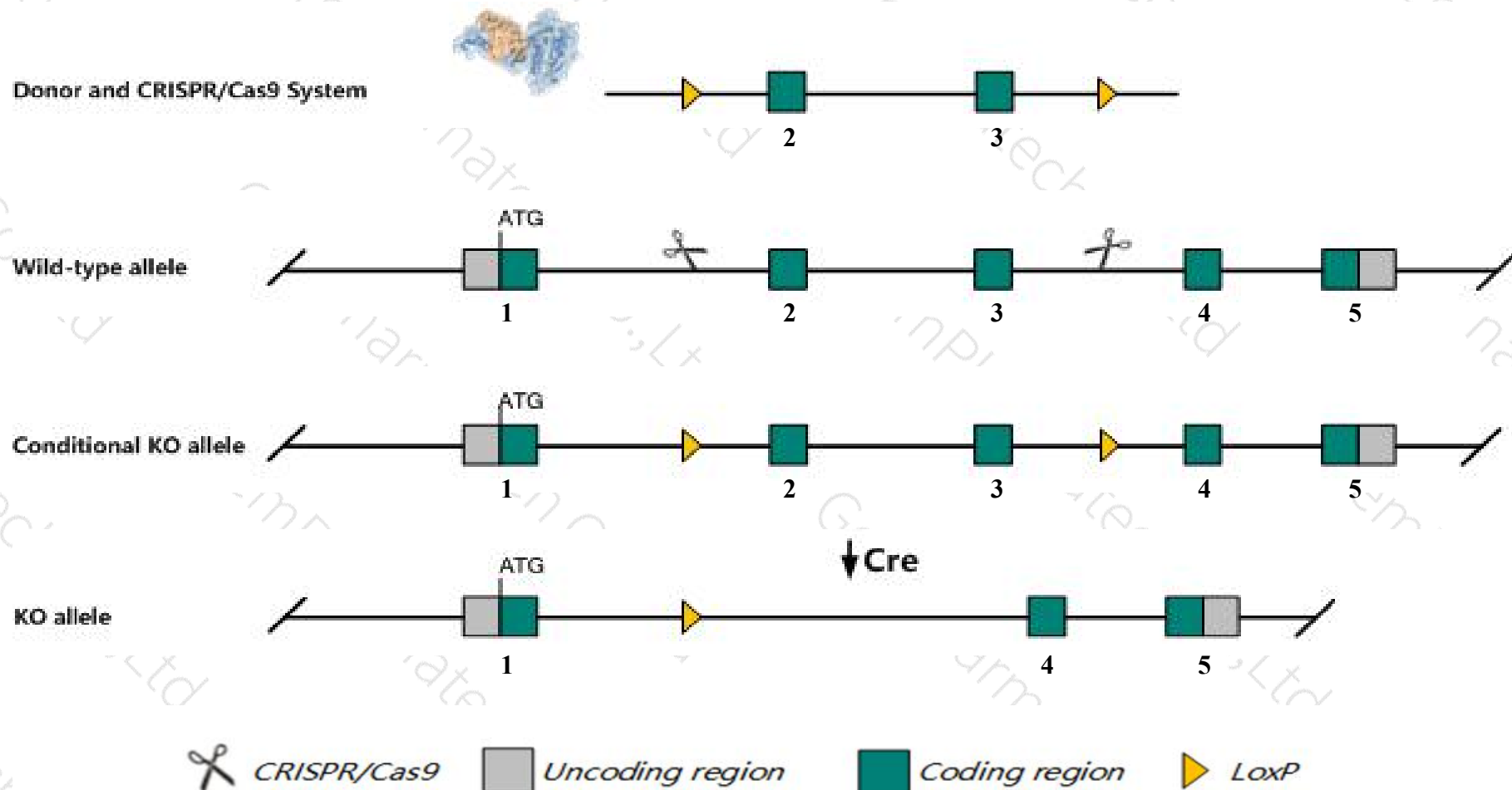
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Hey2* gene. The schematic diagram is as follows:



- The *Hey2* gene has 2 transcripts. According to the structure of *Hey2* gene, exon2-exon3 of *Hey2-201* (ENSMUST00000019924.8) transcript is recommended as the knockout region. The region contains 163bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Hey2* gene. The brief process is as follows: CRISPR/Cas9 system and Donor were microinjected into the fertilized eggs of C57BL/6JGpt mice. Fertilized eggs were transplanted to obtain positive F0 mice which were confirmed by PCR and sequencing. A stable F1 generation mouse model was obtained by mating positive F0 generation mice with C57BL/6JGpt mice.
- The flox mice will be knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues and cell types.

- According to the existing MGI data, Homozygotes for targeted null mutations exhibit cardiac hypertrophy, ventricular septal defects, pulmonary and liver congestion, and reduced preweaning viability.
- The *Hey2* gene is located on the Chr10. If the knockout mice are crossed with other mice strains to obtain double gene positive homozygous mouse offspring, please avoid the two genes on the same chromosome.
- This Strategy is designed based on genetic information in existing databases. Due to the complexity of biological processes, all risk of loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

Hey2 hairy/enhancer-of-split related with YRPW motif 2 [Mus musculus (house mouse)]

Gene ID: 15214, updated on 19-Mar-2019

Summary



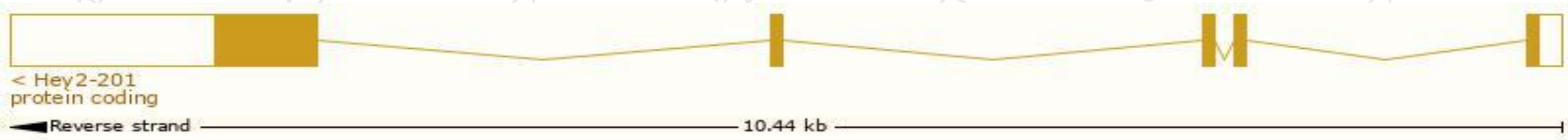
Official Symbol	Hey2 provided by MGI
Official Full Name	hairy/enhancer-of-split related with YRPW motif 2 provided by MGI
Primary source	MGI:MGI:1341884
See related	Ensembl:ENSMUSG00000019789
Gene type	protein coding
RefSeq status	PROVISIONAL
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	CHF1, Herp1, Hrt2, bHLHb32, hesr2
Expression	Biased expression in ovary adult (RPKM 30.7), frontal lobe adult (RPKM 5.4) and 12 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

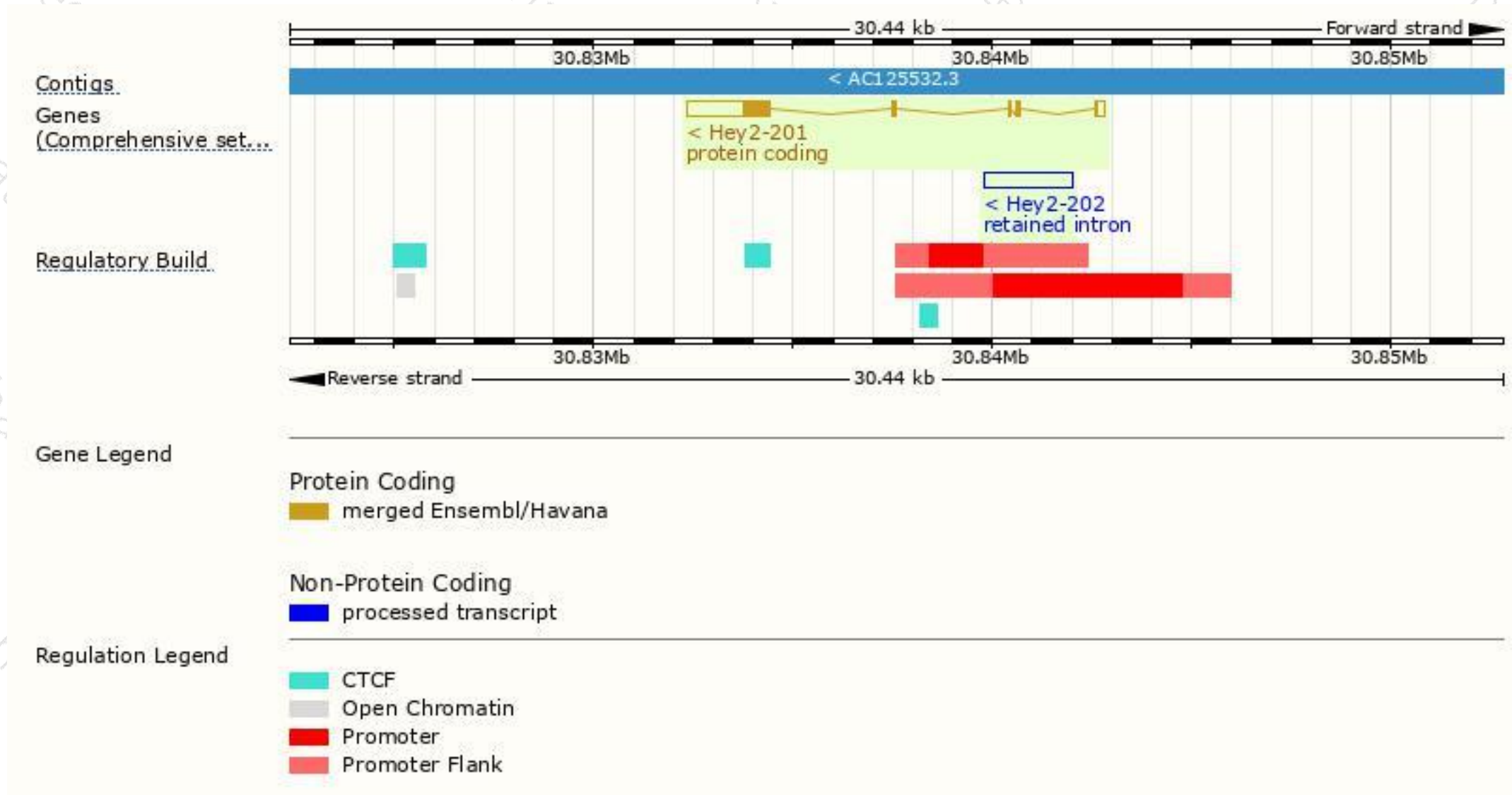
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Hey2-201	ENSMUST00000019924.8	2550	339aa	Protein coding	CCDS23766	Q0VGJ1 Q9QUS4	TSL:1 GENCODE basic APPRIS P1
Hey2-202	ENSMUST00000217504.1	2206	No protein	Retained intron	-	-	TSL:NA

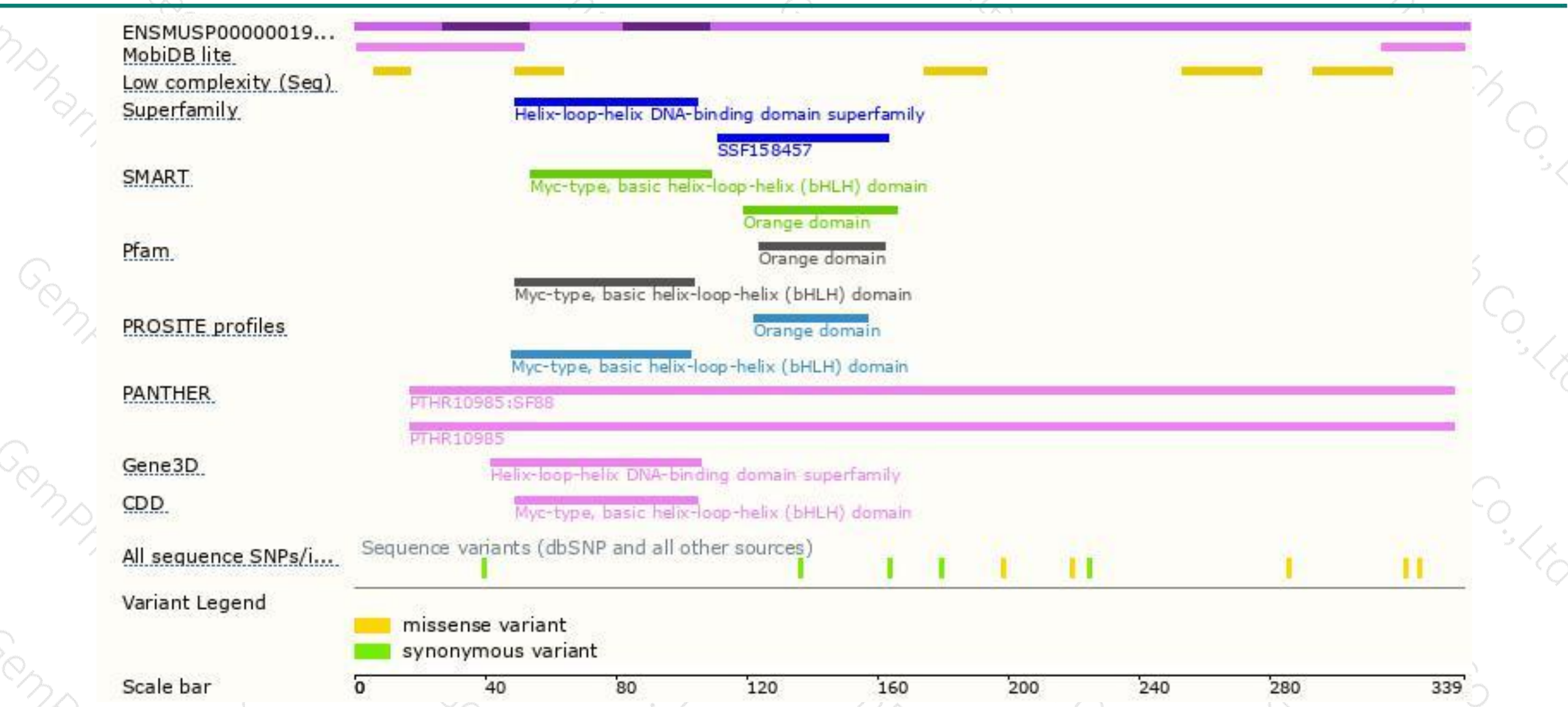
The strategy is based on the design of *Hey2-201* transcript,The transcription is shown below



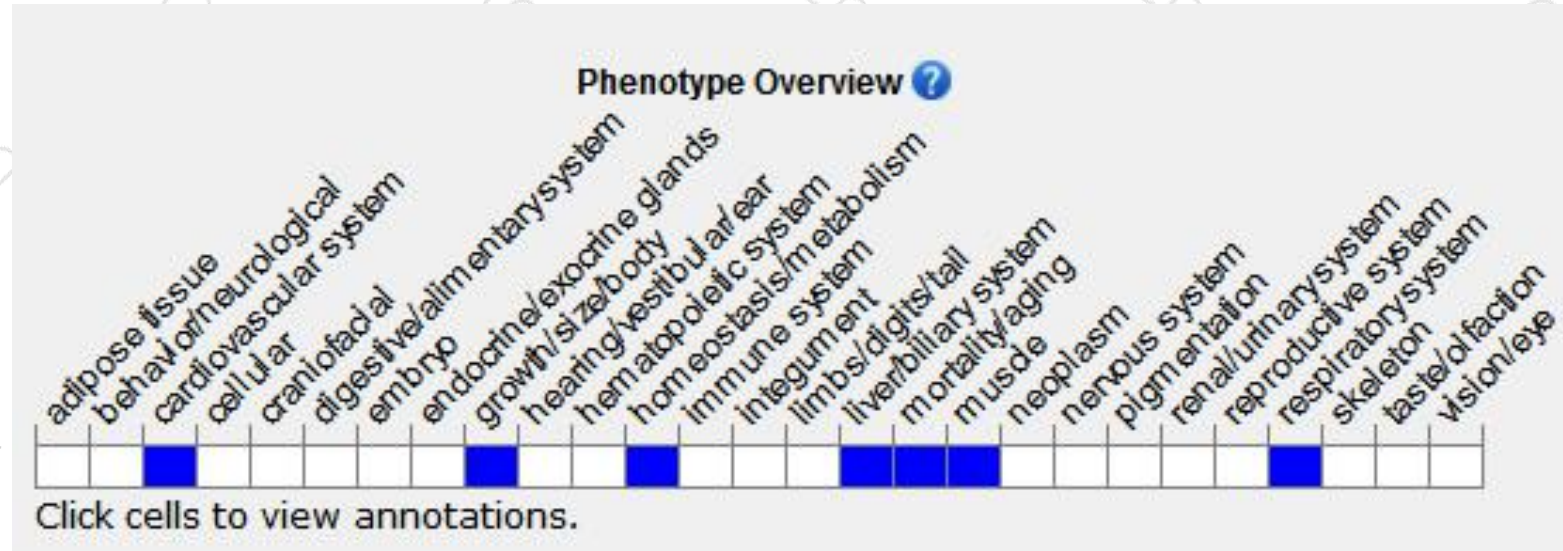
Genomic location distribution



Protein domain



Mouse phenotype description(MGI)



Phenotypes affected by the gene are marked in blue. Data quoted from MGI database(<http://www.informatics.jax.org/>).

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If you have any questions, you are welcome to inquire.

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